

Quantitative EEG for the Cognitive Assessment of Soldiers

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Soldier's Project

- AD/HD & other neuro-cognitive problems can impair a soldier's performance.
- Apply QEEG to improve performance in military training environments.
- 300 military recruits will be tested and analyzed
 - 200 w/Training Difficulties
 - 100 Controls

QEEG Published Research

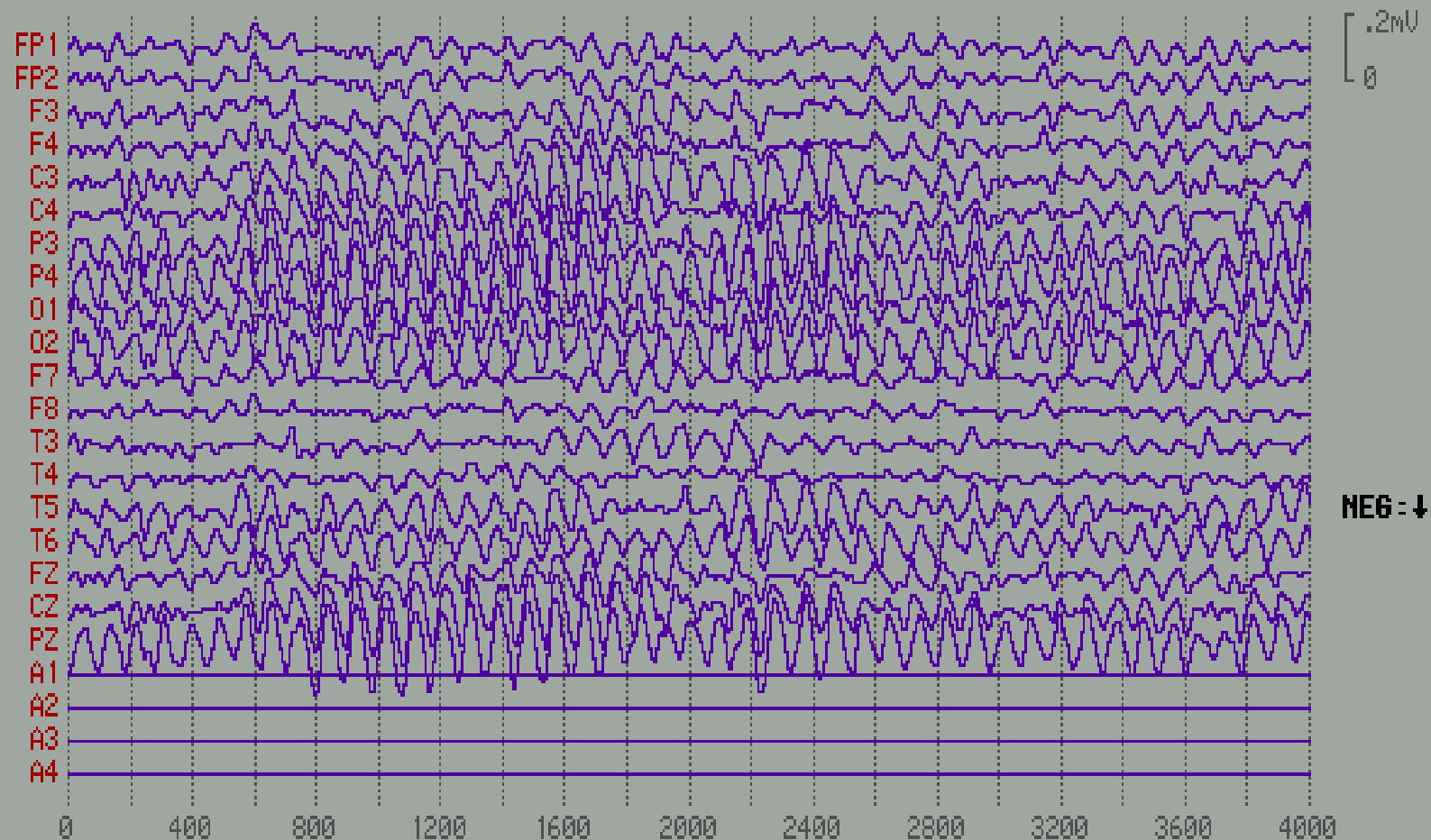
“Of all imaging modalities, the greatest body of replicated evidence ...of psychiatric and development disorders has been provided by EEG and QEEG studies.”

Hughes, J.R., & John, E.R., *Conventional and Quantitative Electroencephalography in Psychiatry*, The Journal of Neuropsychiatry and Clinical Neurosciences, 1999.

Overview

- Electroencephalography (EEG)
- Lexicor's Digital Cortical Scan
- "Soldier's Project"
- Action Items

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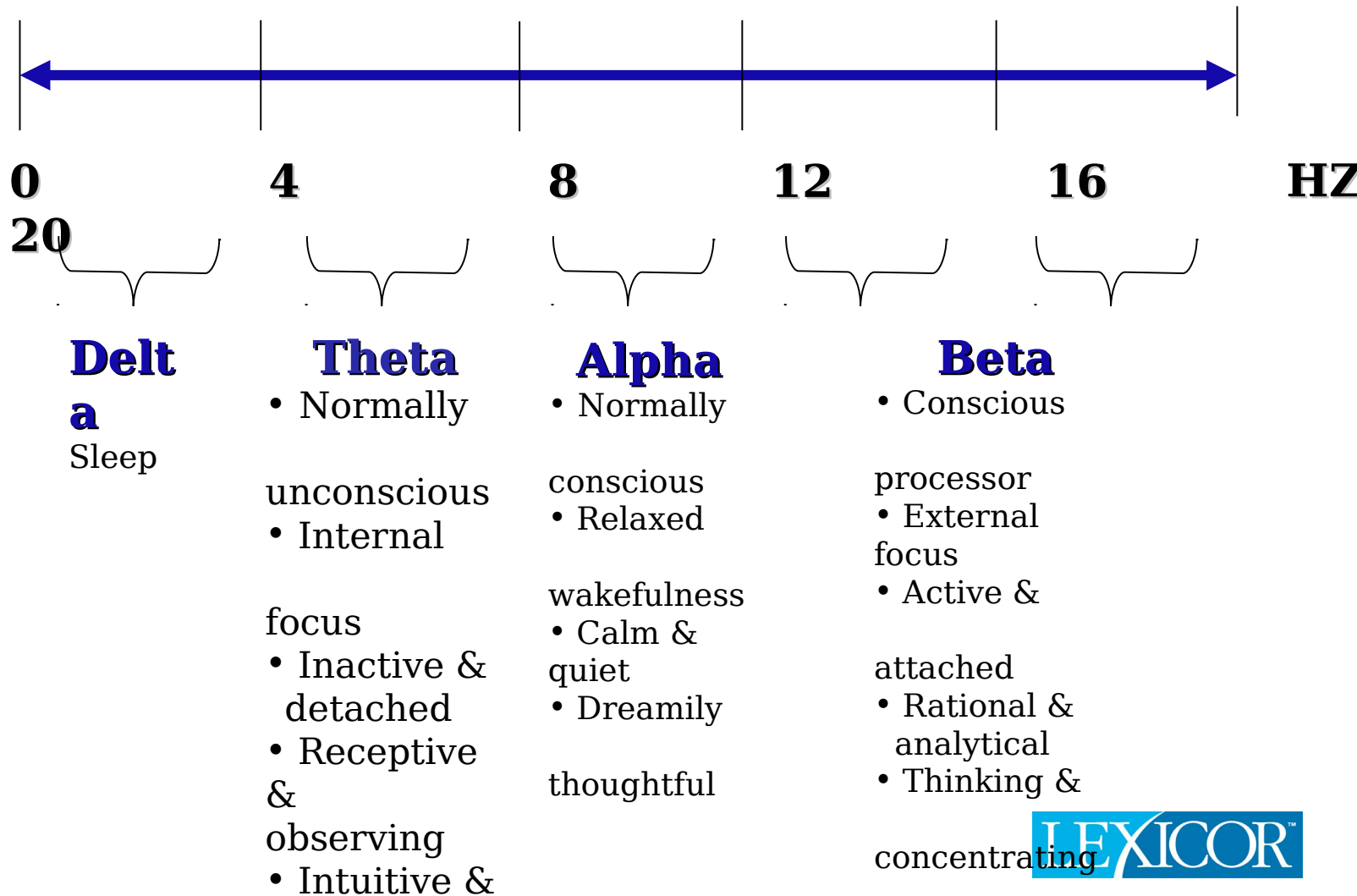
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Electroencephalography (EEG)

- EEG assesses brain functioning by measuring electrical activity through the surface of the scalp
- Non-invasive, painless, inexpensive
- 45-min start to finish



Brainwaves and States of Consciousness



EEG States of Vigilance

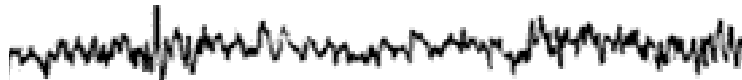
Alertness: beta waves



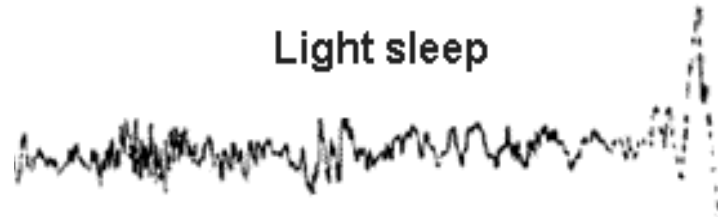
Relaxing: alpha waves



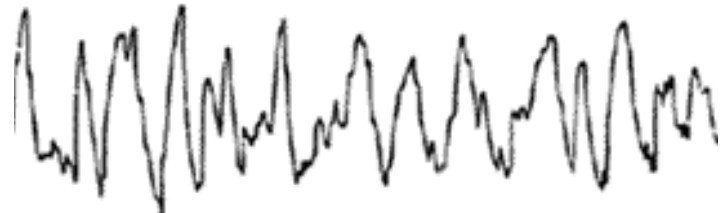
Sleeping: theta waves



Light sleep



Deep sleep: delta waves

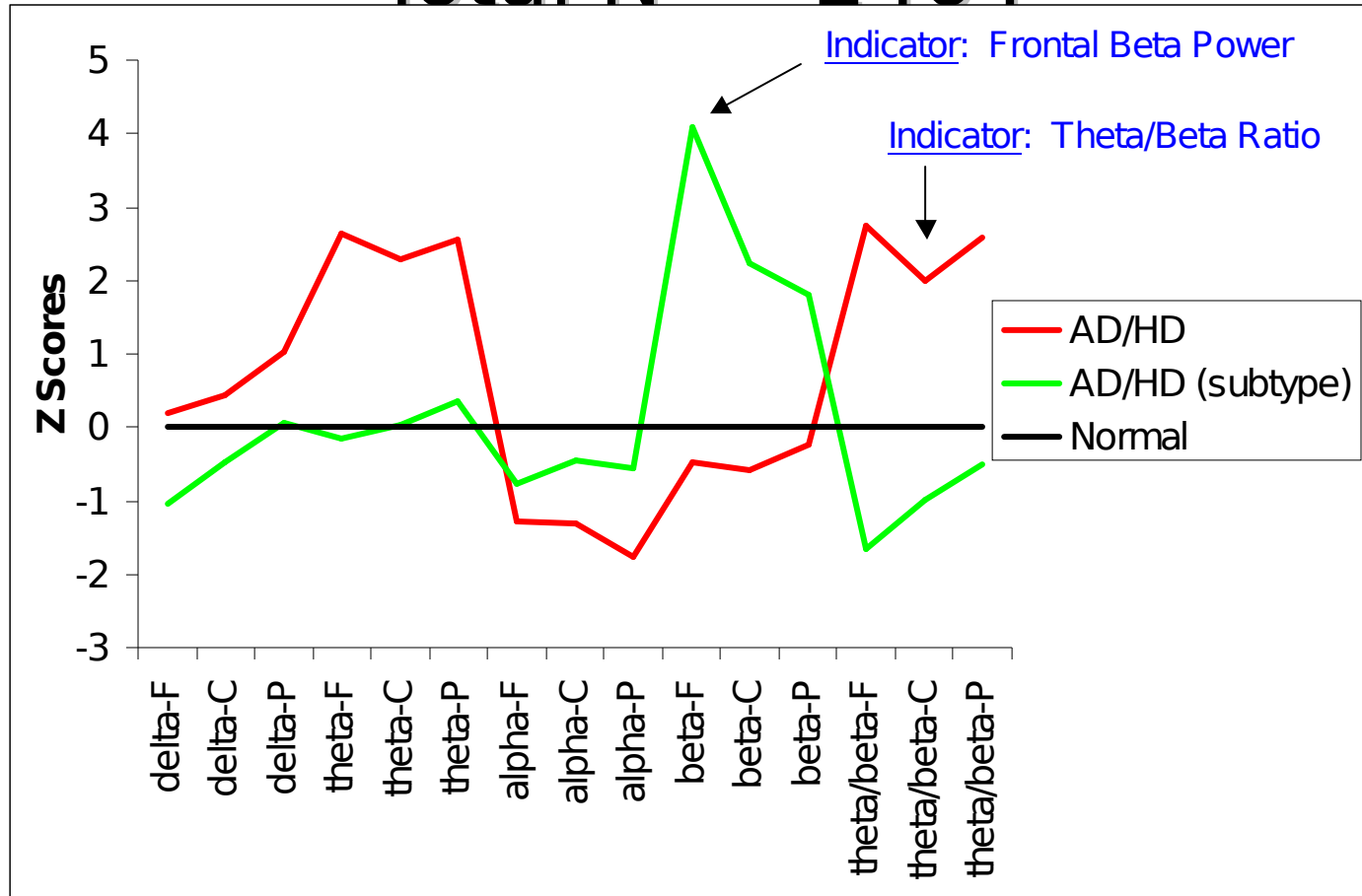


Paradoxical sleep: dreaming (REM)



1998-2002: 13 Published Studies

Total N = 2464

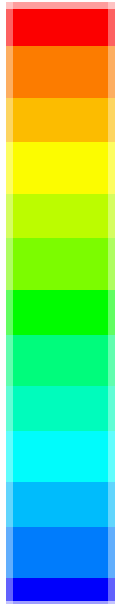
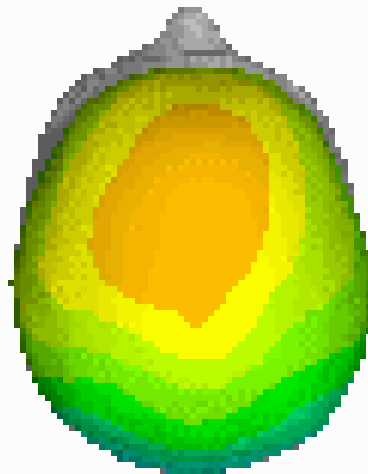
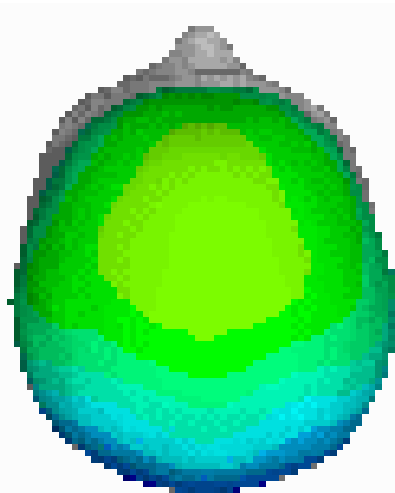


Relative Theta

Normal

ADHD

45%



15%

DataLex AD/HD Indicator Report

**A Patent-
protected Process**



Attention Deficit/ Hyperactivity Disorder (AD/HD) Indicator Report

Patient: JCN
Patient ID: 633
Gender: male
Age: 10.49
Date of Test: 6/5/01
Medications: none

Neuroassessment By:
Curtis Hackley, M.A., CCC QEEG
Phone: 303-444-1792
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Email: Hic455a@AOL.com
The Neuropath Center 2885 Aurora Avenue Ste. 2
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Order Number: 1219

Referred By:

PROCEDURES:

The neuroassessment evaluation was performed using the Lexicor NeuroSearch-24 quantitative electroencephalographic (QEEG) data acquisition unit. Lexicor's proprietary DataLex database was used in the analysis of the data.

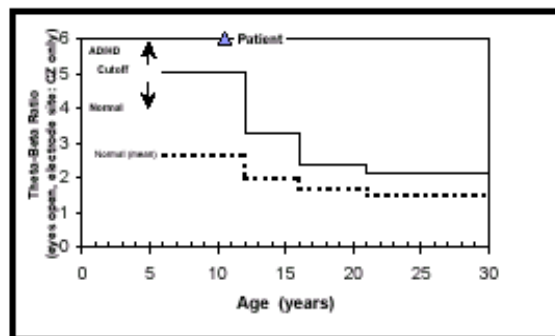
INTERPRETING QEEG DATA FOR AD/HD:

Patients with Inattentive AD/HD typically express an increase in the Theta-Beta ratio. Patients with Combined AD/HD typically express one of two brainwave changes, either 1) an increase in Theta-Beta ratio OR 2) an increase in Frontal Beta Power.

FINDINGS:

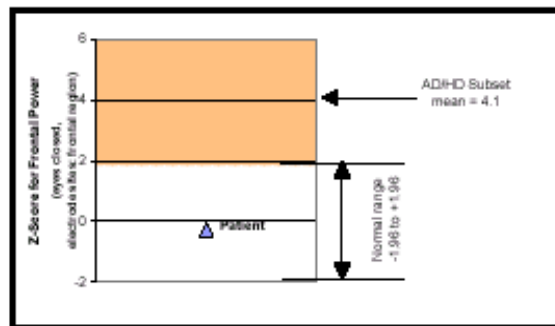
1. Theta-Beta Ratio Indicator for: Inattentive AD/HD Combined AD/HD

Patient's Theta-Beta Ratio
(8.4) is representative of these
AD/HD subtypes for their age
grouping.



2. Frontal Beta Power Indicator for: Combined AD/HD (subset)

Patient's Frontal Beta Power
(-0.29) is within the normal
range for their age grouping.



Soldier's Project

- 200 Trainees experiencing academic difficulties referred to study
- 100 "Normal" Control
- Informed Consent Reviewed and Signed
- Cognitive Performance, Psychometric, & EEG Data collected
- 4 hour assessment session
- Results analyzed and Report Prepared using group data
- Individual results will only be shared with soldier's written permission

Action Items

- Site Selection
2 Training Centers
- IRB Approval
Local
TATRC
- Data Collection
- Results & Report

Military Applications for QEEG

- ADHD
- MTBI
- Peak Performance
- Substance Abuse
- PTSD
- Learning Disabilities
- Depression
- Executive Dysfunction – Decision Making